AMENDMENTS TO THE CLAIMS:

The listing of claims below will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A synchronization method for data demodulation in an OFDM radio receiver, comprising the steps of:

sampling and measuring an OFDM radio transmission to obtain a series of received-signal samples that represent a short preamble, a long preamble, a long preamble guard interval (GI), and a first long preamble, respectively;

computing an inner product of vectors comprised of samples x(n), x(n-1),...,x(n-1-N) and x(n), x(n+1),...,x(n+N-1) and computing the magnitude squared;

to exploit the periodicity of the long preamble, coherent (and non-coherent) combining is performed as follows:

$$y(n) = \left\| \sum_{k=0}^{N-1} \{x(n-k) + x(n-k+64)\}\{x(n+k) + x(n+k+64)\} + \sum_{k=0}^{N-1} x(n+32-k)x(n+32+k) \right\|^2$$

assuming an index of the maximum of the result is the index of the start of the first long preamble;

subtracting a corresponding number of samples to find a first received-signal sample of said long preamble guard interval (GI); and

identifying said first sample of said long preamble GI to synchronize any data demodulation of subsequent parts of said OFDM radio transmission,

wherein *n* is an integer identifying the *n*'th sample, x(n), of the vectors, *N* is an integer having a value determining the number of samples in the vectors, and *k* is an integer having a value varying from 0 to N-1.

2. (Canceled).

3. (Currently Amended) A synchronization method for data demodulation in an OFDM radio receiver, comprising the steps of:

sampling and measuring an OFDM radio transmission to obtain a series of received-signal samples that represent a short preamble, a long preamble guard interval (GI), and a first long preamble, respectively;

~~massaging of~~mathematically manipulating the samples around x(n+32) ~~can be~~ is performed so as to achieve a "coherent" copy of the samples around x(n) and x(n+64)

$$\vec{z}_B(k) = [-x(n+32)\,flipud(conj(x(n+32-1:-1:n+32-N)))]$$

$$\vec{z}_F(n) = [-x(n+32)\,flipud(conj(x(n+32+1:1:n+32-N)))]$$

$$y(n) = \left\| \sum_{k=0}^{N-1} \{x(n-k) + x(n-k+64) + \vec{z}_B(k)\}\{x(n+k) + x(n+k+64) + \vec{z}_F(n)\} \right\|^2$$

assuming an index of the maximum of the result is the index of the start of the first long preamble;

subtracting a corresponding number of samples to find a first received-signal sample of said long preamble guard interval (GI); and

identifying said first sample of said long preamble GI to synchronize any data demodulation of subsequent parts of said OFDM radio transmission,

wherein *n* is an integer identifying the *n*'th sample, x(n), of the vectors, *N* is an integer having a value determining the number of samples in the vectors, and *k* is an integer having a value varying from 0 to N-1.

4. (Currently Amended) A synchronization method for data demodulation in an OFDM receiver, comprising the steps of:

sampling and measuring OFDM radio transmission to obtain a series of received-signal samples that represent a short preamble, a long preamble guard interval (GI), and a first long preamble, respectively;

the vector inner products (complex) result) of the previous and subsequent samples starting at x(n) and x(n+32) are added and then collect the samples at x(n+64+32)

$$y(n) = \left\| \sum_{k=0}^{N-1} x(n-k)x(n+k) + \sum_{k=0}^{N-1} x(n+32-k)x(n+32+k) \right\|^2$$

assuming an index of the maximum of the result is the index of the start of the first long preamble;

subtracting a corresponding number of samples to find a first received-signal sample of said long preamble guard interval (GI); and

identifying said first sample of said long preamble GI to synchronize any data demodulation of subsequent parts of said OFDM radio transmission,

wherein *n* is an integer identifying the *n*'th sample, x(n), of the vectors, *N* is an integer having a value determining the number of samples in the vectors, and *k* is an integer having a value varying from 0 to N-1.

5. (Canceled).